

Electrical Experiment

A FRIEND of mine has called my attention to a letter of F. T. Pirani, of Melbourne, accompanied by some remarks of Prof. J. C. Maxwell, in *NATURE*, vol. xvii. p. 180.

Mr. Pirani concludes his letter with the words, "If the phenomenon (described in the letter) has not been noticed before, I shall be obliged to you if you will kindly communicate it to *NATURE*."

I take the liberty to request you to call, by means of your esteemed journal, the attention of the author to an article of mine, published in the late Prof. Poggendorff's *Annalen der Physik* (vol. clvii., 1876), an abstract of which appeared in the *Philosophical Magazine* (5 ser. vol. i.). The phenomenon alluded to in Mr. Pirani's letter, *i.e.* the existence of an electromotive force due to gravity, in a vertical column of an electrolyte, is, I believe, fully proved by the experiments described in the article. The same difficulties met with by Mr. Pirani and Prof. Maxwell, who repeated the experiment, that is, the presence of irregular, casual currents, due to bubbles of air, &c., have also been encountered by me; I intimate the means of getting rid, to a certain extent, of this influence.

The transport of metal in one direction being accompanied by a transport of the other ion in the opposite direction, the phenomenon is more complete than it might appear at first sight, and the electromotive force changes its sign according to the electrolyte employed.

R. COLLEY

Kasan, Russia, January 23

Oriental Affinities in the Ethiopian Insect-Fauna

MANY naturalists have already drawn attention to the Indian affinities in the African fauna; in other words, the zoological relationship between the Oriental and Ethiopian regions. The late Dr. Stoliczka has pointed this out in the Malayan ornithology; Mr. Wallace has described the same thing in the mammalia and birds of West Africa, these possessing "a special Oriental or even Malayan element." He has also drawn attention to the Oriental element in the Ethiopian reptiles and amphibians, and to the many cases of the same in the South African fauna. Mr. Blandford has treated of the "African element in the fauna of India," more particularly as regards the mammalia; and the late Mr. Blyth has shown the ancient date of this relationship from the evidence afforded by the Siwalik deposits. Mr. Murray has even inclined to the opinion that the Indo-Malayan region should be included with that of Africa, south of the Sahara.

The "Insecta" of the Ethiopian region also shows the same Oriental relationship, which seems to have hitherto received less attention. Dr. Stoliczka has described this in the "Indian Arachnoidea," and Mr. A. Murray in the coleoptera of which he has given the names of eleven genera common to the two regions.

The same thing may be seen in the Lepidoptera and Hemiptera, of which I can only treat briefly, hoping to deal with the subject in a more exhaustive and analytical form when possessed of adequate data, which at present do not exist.

Of the Lepidoptera a few specific examples will perhaps serve the purpose better than the names of the many genera that could be adduced. In the Rhopalocera:—*Danaus chrysippus*, *Melanitis leda*, *Atella phalanx*, *Hypanis ilithia*, *Lycana telicanus*, *Idmias phisadia*, and *Callosone dana*, all belong to the two regions, and with the exception of *C. dana* and *I. phisadia*, have been all recorded from Madagascar. However, *D. chrysippus* (Greece and Turkey), *H. ilithia* (Nubia, Abyssinia, and Arabia), and *L. telicanus* (Egypt and Arabia), would seem to show from those habitats their route of migration from one region to the other. In the Heterocera two examples must suffice, and may be accepted as typical of what probably occurs to a far greater extent among the large number of African moths still unknown to science. *Pusia verticillata* and *Patula macrops* have a wide range over the two areas.

In the African Hemiptera-Heteroptera the Oriental relationship is very pronounced. The following are some of the genera common to the two regions:—*Solenosthedium*, *Hotea*, *Coptosoma*, *Brachyplatys*, *Plataspis*, *Canthecoma*, *Agonoscelsis*, *Antestia*, *Bathycalia*, *Catacanthus*, *Tesseratoma*, *Aspongopus*, *Phyllocephala*, *Macrina*, *Mictis*, *Leptoglossus*, *Odontopus*, *Physopelta*, *Lestomerus*, *Catamiarus*, *Pachynomus*, *Acanthaspis*, *Oncocephalus*, and *Thodelmus*. Genera, of course, are subject to constant revision and redivision, making, as a rule, generic calculations of geo-

graphical distribution very uncertain and unstable. A genus of to-day may embrace species belonging to two regions; to-morrow an author may split this genus into two, for which he may find local characters. In other words, genera common to two regions at the present time may be shown as the contrary by a later worker. In a general way the value of the term genus is often equal to the value of the term species. The twenty-four genera of Hemiptera, however, which I have enumerated above, may be accepted as more certain examples. Dr. Stål has paid particular attention to this order, and has made many genera from a minute examination of structure, and I think his divisions must at least be considered as sufficiently exhaustive. I have carefully compared my list with his latest classification, and find that eighteen out of the twenty-four genera still remain intact on his catalogue, one other is common to the two regions from an East African species I recently described, and so only five remain, which Dr. Stål has further subdivided. Of these twenty-four genera, twenty-two extend to the West African sub-region, twelve have at the present time also been recorded from China, and twelve from the Australian region. When we further analyse the list as to the probable route of migration, it is found that eight genera appear in Madagascar and two in Réunion; whilst a northern junction is also indicated by one genus being found in Tangier and Syria, two in Egypt, and one in Abyssinia. A few species are common to the two regions, as *Leptoglossus membranaceus*, *Oncocephalus annulipes*, &c.

It is probable that the African Neuroptera and Orthoptera may show the same affinities.

W. L. DISTANT

Derwent Grove, East Dulwich

Sense in Insects—Drowned by a Devil-Fish

In the file of *NATURE* from October 18 to the end of November which I have just received, I find a discussion regarding the senses possessed by insects, especially the lepidoptera. For years I have been in the habit of collecting these insects for my friends, and of course have become more or less acquainted with their habits. I recall one or two instances in point. In Costa Rica the Heliconias frequent certain flowers, and pass over others of the same colour and same approximate size without noticing them. But the most marked case was of the large brilliant Morphos. My Indian servants always carried with them a fermented paste of maize flour, which they mixed with water to the consistency of gruel as a beverage. On our arriving at the side of a stream in a narrow gorge, invariably, within a few minutes after they opened a package of this paste, although there might not have been a butterfly in sight before, those most brilliant of their kind would come sailing up, always from leeward, and I have made some of my best catches in this manner. I have also caught them by baiting with a piece of over-ripe or even rotting banana. At other times they were almost unapproachable. They seem to live on fruits just merging into the state of rottenness.

I have never been able to detect any sensitiveness to sound in insects, and suspect that the case cited by one of your correspondents might be equally explained by sight, or by the vibration of the air caused by striking the glass. That certain coleoptera and diptera are attracted by smell alone is too obvious to require proof.

The same may be said of ants in following an established trail. I have experimented with this frequently, obliterating the scent for a space of but a few inches; and watching the puzzled wanderers each going an inch or less beyond his predecessor, hunting the lost clue until the blank was finally bridged over. After that if the new route as re-opened differed from the old, it was nevertheless rigidly followed even if longer and less direct.

Another matter. You mention a case of "drowning by a devil-fish" (*NATURE*, vol. xvii. p. 27). The story is to me very probable. I once measured a specimen of my *Octopus punctatus* caught in San Francisco harbour, which gave clear 15 feet from point to point of the arms. The animal, as I bought it from a fisherman, filled a champagne basket.

W. M. GABB

Puerto Plata, Sto. Domingo, December 29, 1877

Drowned by a Devil Fish

THOUGH in British Columbia at the time or the occurrence of the incident referred to by Mr. Moseley in *NATURE* (vol. xvii. p. 27) I was in the interior, and consequently heard nothing of the matter. On reading Mr. Moseley's letter, however, I wrote

to my friend Dr. W. F. Tolmie, of Victoria, and have just received from him an account verifying in all essential particulars the extract quoted by Mr. Moseley from the *Weekly Oregonian*.

A party of Makah or Makah Indians of Cape Flattery were returning from a visit to the Songish Indians of the vicinity of Victoria, and camped the first afternoon at Metchosin, on the south shore of Vancouver Island. A young woman having separated herself from the others to bathe, did not return in the evening, and after having searched for her in vain the next morning, the rest of the party were about to continue on their journey, when, on rounding the first point, they saw the body of the woman as if seated on the sandy sea-bottom, with a large octopus attached to it, which, according to the description of Dr. Tolmie's informant, resembled a "fifty-pound flour sack, full." The body was rescued in the manner described in the *Oregonian*, and when brought ashore, still had portions of the arms of the octopus adhering to it.

Dr. Tolmie also mentions the case of an Indian woman at Fort Simpson, who had, many years ago, a narrow escape from a similar death; also that among the Chimsyan Indians traditions of escapes and occasional cases of drowning exist, and further, that among these people a story is current that "A two-masted vessel manned in part or whole by men with obliquely placed eyes and wearing queues (at Milbank Sound, lat. 52°, about seventy years ago) was seized by an enormous squid, whose tentacles had to be chopped with axes ere the craft was clear of it. The ship is said to have been wrecked further south on the coast, in consequence of the evil influence of the monster."

GEORGE M. DAWSON

Geological Survey of Canada, Montreal, January 11

Eucalyptus

IN NATURE, vol. xvii. p. 10, Mr. A. Nicols says he has seen attacks of fever come on in a forest of Eucalyptus; malaria prevails there, he maintains. Does that malaria, the degree of gravity of which he does not describe, seriously compromise health? That is the question. It is probable, notwithstanding the presence of Eucalyptus, that there are yet numerous cases of fever near Lake Fetzara (Algeria), but really of such small importance as to permit, without serious danger to health, the working of the ground or the mines of these districts.

As to mosquitoes, allow me to recall that there exist very many species of these animals which, apart from their common quality of feeding on and tormenting mammals, and especially man, have origins, habitats, evolutions, and habits completely different; some live only in the larval state, others frequent moist ground, and others live, always in the larval state, in fungi. In a country which is far from being tropical and marshy, Newfoundland, the pine woods are infested during the short summer by myriads of mosquitoes, which become a real danger for the rash traveller. It will be understood that all these species do not exist at the same time in the same place, and that at Lake Fetzara the marshes are being profoundly modified, or are disappearing, and the mosquitoes, properly called, are also disappearing. Moreover, if there does not exist in the country, as is probable, any species of mosquito living in the shade of the forest, the country will be rid of these animals, a thing which cannot take place in Australia, where there are species living in the forests. In other words, it is not the Eucalyptus which at Fetzara has caused the mosquitoes to disappear, but rather the absence of the conditions necessary to the life and reproduction of mosquitoes, which have become deficient in consequence of the modification of the soil, brought about by the numerous plantations of Eucalyptus.

DR. CALMY

Saigon, December 19, 1877

Explosive Dust

IN NATURE, vol. xvii. p. 123, I noticed a letter by A. Mac-kennah on an explosion of malt dust in a grinding machine. This I believe to be not an uncommon occurrence, as I hear there have been three explosions in our mill within a period of four years, and these not due to any such culpable carelessness as allowing a naked flame to approach the heated impalpable dust, but ignited either by a spark from a piece of flint passing through the steel rollers (barley from some localities is invariably accompanied by quantities of small fragments of flint), or from excessive friction on some part of the wood fittings.

The following facts I obtained from the man in charge of our mill at the time of the worst of these explosions, about three years ago:—

They were grinding at the ordinary pace about mid-day with the window open and no gas turned on.

The explosion was quite sudden and the flame sufficient to singe the man's whiskers; the force was so great that the door of the engine-room was blown open, though the only opening between the two rooms was a small hole through which the shafting worked.

Having had several holes bored through the wood lining to allow a free current of air, there has been no explosion since.

The danger of fine impalpable coal dust in collieries is too manifest to need argument based on the action of analogous bodies, but still the above facts may interest some of your readers.

F. E. L.

Burton-on-Trent, January 22

Dendritic Gold

WILL one of my fellow-readers of NATURE be good enough to inform me, through its columns, with the name and publisher of such a work on mineralogy (short, if possible) as will give me the best information on the subject of the dendritic gold existing in sandstones in New Zealand, as reported in the *Proceedings of the Wellington Society* (NATURE, vol. xvi. p. 567).

It is my wish specially to know the colour of such dendrites, the geologic age of the rock containing them, and, if possible, to obtain a satisfactory account of their origin, as hitherto I have believed that metals take this form solely by deposition from solution.

I ask this in the interest of friends in South Africa (in addition to the personal desire for knowledge), where, in many parts of the Transvaal, gold "prospects" can be obtained, though usually in quantities unprofitably small, in nearly every case there being no quartz from which it could have been derived; at least so said my informants, old Australians.

Black dendrites I have noticed between the (once) horizontal strata of sandstone boulders in the Kimberley diamond mine, but was unable, at the time, to decide their nature. R.

DEMONSTRATION OF CURRENTS ORIGINATED BY THE VOICE IN BELL'S TELEPHONE

IF two wires, A and B, be respectively connected with the two binding screws, R and S, of a telephone, and the other ends of the wires be connected with a Thompson's reflecting galvanometer, the following experiments can be made:—

1. On pressing in the iron disc a deflection is produced on the scale, say, from right to left.

2. On reversing the wires so that A is connected with S and B with R, and repeating Experiment 1, a deflection is produced in the opposite direction, *i.e.* from left to right.

3. Shouting or singing produces no deflection.

If a Lippmann's capillary electrometer be substituted for the galvanometer, the following results are obtained:—

4. If Experiments 1 and 2 be repeated, similar movements are observed, *i.e.* in one case the mercury column moves to the point of the capillary tube, in the other away from it.

5. If the gamut be loudly sung up, note by note, to the sound *ah*, one note is found to give a movement of the mercury column, about ten times as great as that observed in Experiment 4, towards the point of the tube. The octaves, especially the higher ones, and some harmonics of this note yield similar results. (It is this note which tetanises a nerve muscle preparation as observed by Fick, &c.)

6. If the wires be reversed and the same note sung, a movement of the mercury column is seen as large as that in Experiment 5, but in the same direction. *So that reversing the wires does not alter the direction as indicated by the electrometer.*

7. If the primary wire of a Du Bois Reymond's coil be placed in the circuit of a telephone, and the wires from the secondary circuit coupled with the electrometer, the note mentioned above produces the same movement as in Experiments 5 and 6, when the secondary coil is about